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TOSHIBA AMERICA INFORMATION SYSTEMS
STORAGE DEVICE DIVISION
IRVINE, CALIFORNIA

MK6414MAP (HDD2144)
2.5-INCH HARD DISK DRIVE
USER MANUAL

Rev 02

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INTRODUCTION – MK6414MAP (HDD2144)

General Features

- 2.5" sized drive
- 1 Platter
- 6 Gigabytes*
- 9.5mm High
- 13ms Average Seek Time
- ATA-2,3,4 Interface
- Ultra 66 Supported
- 1024KB Buffer
- Rotational speed of 4,200rpm
- MTTF 300,000 Hours

**Toshiba defines a megabyte (MB) as 1,000,000 bytes and a gigabyte (GB) as 1,000,000,000 bytes.*

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SETUP – MK6414MAP (HDD2144)

***Caution**: Your Hard Disk Drive is a precision device and even a small drop onto any surface can cause damage. Electronstatic discharge can also damage the drive. You should ground yourself prior to handling the drive.*

Master/Slave Settings

Your Toshiba Hard Disk Drive can be configured as either a "Master" or "Slave" unit. Master configuration is used for all single drive applications, and master or slave configuration (only one of each per port) is used for two drive applications. Use the information in the following table before setting drive as Master or Slave.
Master configuration is obtained by setting jumpers A, B, C & D open (no jumper present). Slave configuration is obtained by setting jumpers C-D. When B-D jumper is installed, the drive is configured as cable select. If pin 28 = Low, the drive is "Master", if pin 28 - High, the drive is "Slave".

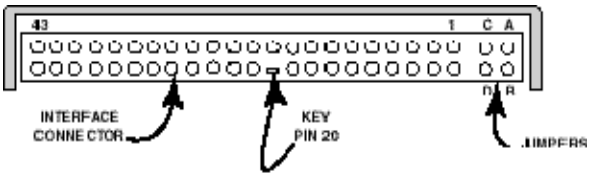

Figure 1.HDD Jumper Locations

JUMPER	P28	DRIVE
No Jumper	-	Master Drive
C-D Jumper	-	Slave Drive
B-D Jumper	LOW	Master Drive
B-D Jumper	HIGH	Slave Drive
A-B Jumper	-	Prohibit
A-C Jumper	-	Prohibit

Installation Notes

- The drive should be mounted carefully on the surface of 0.1mm or less flatness to avoid excessive distortion.
- In order to prevent short-circuit under any circumstances, a space of 0.5mm or more should be kept under the PCB.
- Space should be kept around the drive to avoid any contact with other parts, which may occur due to shock or vibration.
- The temperature of the top cover and the base must always be kept under 60C to maintain the required reliability.
- Be sure not to cover the breathing hole to keep the pressure inside the drive at a certain level
- Do not apply any force to the top cover, except the screw areas on top cover. Maximum force to the specified area is 2N.
- The drive contains several parts which may be easily damaged by ESD (Electric Static Discharge). Avoid touching the interface connector pins and the surface of PCB. Be sure to use ESD proof wrist strap when handling drive.
- The four mounting screws should be tightened equally with 0.3N-m (3kgf-cm) torque. The depth should be 3.0mm minimum and 3.5mm maximum.

Placing Hard Drive inside your Computer

- Determine mounting configuration (the drive can be mounted in either a horizontal or vertical orientation)
- Configure drive for system application.
- Configure the adapter board for the specific system application (if required).
- Install adapter board into an unused PC/AT 16 bit slot (if required).
- Install the I/F cable to the system's 44 pin connector port or adapter board. Ensure pin 1 is oriented correctly, (pin 1 on the cable is usually identified by a red or blue strip.)
- Set correct drive type in system CMOS
- Refer to applicable manuals for software installation instructions.

Important Note: Disconnect power from your computer system before beginning installation.

Figure 2.HDD Mounting Holes

USING THE HARD DISK DRIVE – MK6414MAP (HDD2144)

Backing up Data Files

To avoid data loss, regularly back up the data files on the hard disk drive.

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TROUBLESHOOTING – MK6414MAP (HDD2144)

Problem	Solution
My system is not able to recognize all available capacity on my Hard Disk Drive. What do I need to do to utilize the complete hard drive?	There are some systems that are unable to recognize the new larger Hard Drives on the market. 3rd party software is available that breaks the "capacity barrier". Some suggestions are EZ Drive by Micro House and Disk Manager DiskGo by Ontrack. Check with your local computer/software supplier for availability or contact the software manufacturer.
How do I install my 2.5" Toshiba Hard Drive into my desktop or tower system?	You will need a HDD mounting kit in order to install a Toshiba 2.5" drive into your desktop or tower system. Contact your local computer supplier for kit availability.

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SPECIFICATIONS – MK6414MAP (HDD2144)

General

Model	MK6414MAP (HDD2144)
Interface	ATA-2/3/4

Functionality

Formatted Capacity	6.007GB*
Rotational Speed	4200rpm
Avg. Rotational Latency	7.14/ms
Spin-up Time	4sec (typical)
Buffer	1024KB
Seek Time (Average)	13
Internal Transfer Rate	104.35 ~ 193.88Mbits/sec (max)
Host Transfer Rate	
Ultra DMA mode	66.7Mbytes/sec
PIO Mode	16.6Mbytes/sec
Interleave Factor	1.1

**Toshiba defines a megabyte (MB) as 1,000,000 bytes and a gigabyte (GB) as 1,000,000,000 bytes.*

Internal Drive Characteristics

Number of Disks	1
Number of Read/Write Heads	2
Track Density (TPI)	1022 (26.0K)
Logical Cylinders	12,416
Logical Heads	15
Logical Sectors/track	63
Bytes per Sector	512
Logical Blocks (LBA)	11,733,120

Reliability

Preventative maintenance	None
Nonrecoverable read errors	1 error per 10^{13} bits read

Electrical

Voltage	5V ±5%

Power Consumption

Start	2.7W typ
Seek	2.3W typ
Read/Write	2.2W typ
Sleep	0.1W typ
Energy Consumption Efficiency	0.108W/GB avg

Shock	
Operating	1,470m/s^2 (150G)(2msec)
Non-Operating	6,8600m/s^2 (700G)(1msec)

Physical

Height	0.37" (9.5mm)
Width	2.75" (69.85mm)
Depth	3.94" (100mm)
Weight	3.49oz (99g) typ

Regulatory

The drive satisfies the following standards:

Underwriters Laboratories (UL)	1950
Canadian Standard Association (CSA)	C22.2 No.220 No. 950
TUV Rheinland	EN 60 950
EMC - EN50081-1	EN55022: 1988 Class B EN60555-2: 1987+ A1 EN60555-3: 77A (Co) 38
EMC - EN50082-1	IEC 801-2: 1991 EIC 801-3: 1994 IEC 801-4: 1988

DRIVE CONNECTORS – MK6414MAP (HDD2144)

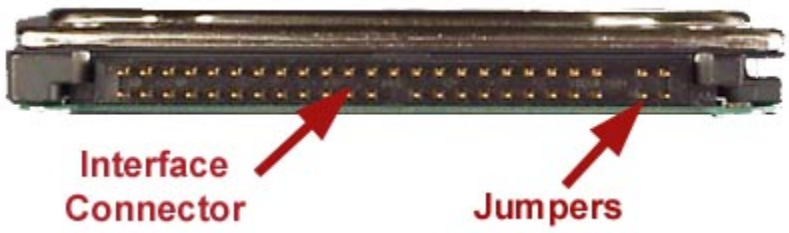

Figure 1.MK6414MAP HDD Rear View - Connectors

Interface Connector

Drive Side Connector	Yamaichi GAP050K11617 or equivalent
Recommended Host Side Connector	
Board	Straight type: Berg 86455-044 86456-044 or equivalent
Cable	Berg 89361-044 or equivalent

Recommended Cable Characteristics

Standard diameter	0.32mm (28AWG)
Characteristics impedance	100 - 132ohm
Max Length	0.46mm (max)
Capacitance	35pF (max)

** cable is not included with drive*

Interface Pin Assignment

DRIVE INTERFACE SIGNALS			
PIN	SIGNAL	PIN	SIGNAL
1	RESET	2	GROUND
3	DD 7	4	DD 8
5	DD 6	6	DD 9
7	DD 5	8	DD 10
9	DD 4	10	DD 11
11	DD 3	12	DD 12
13	DD 2	14	DD 13
15	DD 1	16	DD 14
17	DD 0	18	DD 15
19	GROUND	20	KEY
21	DMARQ	22	GROUND
23	DIOW/STOP	24	GROUND
25	DIOR/ -DMARDY HSTROBE	26	GROUND
27	IORDY/ -DMARDY/- DSTROBE	28	CSEL
29	DMACK	30	GROUND
31	INTRQ	32	IOCS16
33	DA1	34	PDIAG
35	DA0	36	DA 2
37	CS0	38	CS1
39	DASP	40	GROUND
41	+5V (LOGIC)	42	+5V (MOTOR)
43	GROUND	44	RESERVED
Note: Symbol () in front of signal indicates negative logic.			